

**WHAT IS CLAIMED IS:**

1. A roof assembly for a stadium, comprising:

at least one major truss spanning a distance between a first support location and a second support location that is at least 200 feet, said major truss being structurally configured as a tied arch having a curved convex upper portion and a lower portion that is shaped, sized and positioned to assume most gravity induced stress within the major truss as tension; and

at least one roof member that is secured to said major truss.

2. A roof assembly according to claim 1, comprising at least two of said major trusses.

3. A roof assembly according to claim 1, wherein said roof member is secured to said curved, convex upper portion of said major truss.

4. A roof assembly according to claim 1, wherein said roof member is mounted to said major truss so as to be movable with respect thereto.

5. A roof assembly according to claim 1, wherein said major truss does not make substantial utilization of diagonal structural elements therein to assume horizontal stress within said major truss.

6. A roof assembly according to claim 1, further comprising a curved, convex guide track that is secured to said curved, convex upper portion of said major truss, and wherein said roof member is constructed and arranged to be moved over said guide track.

7. A roof assembly according to claim 6, further comprising a retention mechanism for preventing said roof member from being lifted upwardly with respect to said guide track.

8. A roof assembly according to claim 7, wherein said retention mechanism comprises at least one retention element for engaging a downwardly facing surface of said guide track in the event of initiation of upward vertical movement of said roof member relative to said guide track.

9. A roof assembly according to claim 8, wherein said roof member comprises a first wheel that is engaged with an upwardly facing surface of said guide track and wherein said retention element comprises a second wheel that is engaged with said downwardly facing surface of said guide track, and further comprising a biasing mechanism for biasing the first wheel toward the second wheel, whereby both the first wheel and the second wheel will be urged against the guide track.

10. A roof assembly according to claim 9, further comprising a drive system for powering at least one of said first and second wheels.

11. A roof assembly according to claim 9, wherein said guide track is convex in shape, and wherein said biasing mechanism is adequate to bias said first and second wheels to ensure adequate traction with respect to said guide track so that said drive system will be able to move said roof member upwardly along the convex guide track against the forces of gravity.

12. A roof assembly according to claim 1, wherein said major truss is constructed and arranged to have a center of mass that is positioned substantially along a span axis that intersects both said first and second support locations.

13. A roof assembly according to claim 12, wherein said major truss is shaped so as to be substantially symmetrical about said span axis.

14. A roof assembly according to claim 1, wherein said major truss is generally lenticular in shape.

15. A roof assembly according to claim 14, wherein said major truss has a maximum vertical dimension  $V_{max}$  and wherein said distance between said first support location and said second support location may be expressed as  $L_{max}$ , and wherein  $V_{max}$  as a percentage of  $L_{max}$  is within a range of about 4 percent to about 20 percent.

16. A roof assembly according to claim 15, wherein  $V_{max}$  as a percentage of  $L_{max}$  is within a range of about 5 percent to about 15 percent.

17. A roof assembly according to claim 16, wherein  $V_{max}$  as a percentage of  $L_{max}$  is within a range of about 10 percent to about 12.5 percent.

18. A roof assembly according to claim 15, wherein  $L_{max}$  is at least 500 feet.

19. A convertible stadium assembly, comprising:

    a stadium comprising an exhibition area, a seating area and a plurality of roof support locations;

    a first major truss spanning a distance between a first of said roof support locations and a second of said roof support locations that is at least 200 feet, said first major truss being structurally configured as a tied arch;

    a second major truss spanning a distance between a third of said roof support locations and a fourth of said roof support locations that is also at least 200 feet, said second major truss also being structurally configured as a tied arch;

    a first guide track mounted to said first major truss;

    a second guide track mounted to said second major truss;

    a movable roof member that is mounted for movement along said first guide track at a first location and that is further mounted for movement along said second guide track at a second location;

a drive system for moving said movable roof member along said first and second guide tracks; and

a control system for controlling said drive system.

20. A convertible stadium assembly according to claim 19, wherein said first guide track is substantially parallel to said second guide track.

21. A convertible stadium assembly according to claim 20, wherein said first and second guide tracks are both shaped so that upwardly facing surfaces thereof are both convex.

22. A convertible stadium according to claim 21, wherein said roof member comprises a first wheel that is engaged with an upwardly facing surface of said first guide track and a second wheel that is engaged with a downwardly facing surface of said first guide track, and further comprising a biasing mechanism for biasing the first wheel toward the second wheel, whereby both the first wheel and the second wheel will be urged against the guide track.

23. A convertible stadium according to claim 22, wherein said drive system is constructed and arranged for powering at least one of said first and second wheels.

24. A convertible stadium according to claim 21, wherein said drive system is constructed and arranged to apply power with sufficient traction to said first and second guide tracks so as to be able to move said movable roof member along said convex upwardly facing surfaces of said first and second guide tracks.

25. A convertible stadium assembly, comprising:

a stadium comprising an exhibition area, a seating area and a plurality of roof support locations;

a first support structure spanning a distance between a first of said roof support locations and a second of said roof support locations that is at least 200 feet;

a second support structure spanning a distance between a third of said roof support locations and a fourth of said roof support locations that is also at least 200 feet;

a first guide track mounted to said first support structure, said first guide track being shaped so as to be continuously convexly upwardly curved;

a second guide track mounted to said second support structure, said second guide track being shaped so as to be continuously convexly upwardly curved;

a movable roof member that is mounted for movement along said first guide track at a first location and that is further mounted for movement along said second guide track at a second location;

a drive system for moving said movable roof member along said first and second guide tracks; and

a control system for controlling said drive system.

26. A convertible stadium assembly according to claim 25, wherein said first guide track is substantially parallel to said second guide track.

27. A convertible stadium according to claim 25, wherein said roof member comprises a first wheel that is engaged with an upwardly facing surface of said first guide track and a second wheel that is engaged with a downwardly facing surface of said first guide track, and further comprising a biasing mechanism for biasing the first wheel toward the second wheel, whereby both the first wheel and the second wheel will be urged against the guide track.

28. A convertible stadium according to claim 27, wherein said drive system is constructed and arranged for powering at least one of said first and second wheels.

29. A convertible stadium according to claim 25, wherein said drive system is constructed and arranged to apply power with sufficient traction to said first and second guide tracks so as to be able to move said movable roof member along said convex upwardly facing surfaces of said first and second guide tracks.